Telescience Resource Kit (TReK)

TReK Review Package

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Background

Between 1997 and 2002, several versions of TReK software (TReK Release 1 – TReK Release 3) were developed and released into operation in support of the International Space Station program. This software was developed to run on Windows. In 2013, an Engineering Change Request was approved to provide TReK on Linux. The new cross platform version of TReK software is currently in work and will be deployed in phases during the 2014-2017 timeframe. This will include multiple beta releases that precede each incremental operational release. The TReK Beta Software Testing Program provides an opportunity for you to test drive the TReK software and provide feedback to improve the product, an opportunity to review TReK requirements and design, and early access to the TReK software.

The new TReK cross-platform software is composed of the TReK Toolkit, the TReK Desktop, and TReK Mobile.

TReK Toolkit
The TReK Toolkit is a suite of lightweight libraries and utility applications. It will include capabilities to access International Space Station payloads using standard network protocols and services, support for delay tolerant networking, and support for EXPRESS Payload to ISS C&DH System Ethernet interfaces. The TReK Toolkit is suitable for use on the ground and onboard ISS. The TReK Toolkit is a subset of the TReK Desktop.

TReK Desktop
TReK Desktop provides the complete set of TReK capabilities in a Windows and Linux environment. This includes existing capabilities and enhancements based on user requests and lessons learned.

TReK Mobile
TReK capabilities available in a mobile environment (Android & IOS).   This is a new area that is expected to evolve over time. Work is in progress to evaluate possible architectures and gather an initial set of requirements.

Information About This Review

- Review Purpose
  - Provide an opportunity to review the TReK 4.3.0 Toolkit requirements and software.
  - Provide an opportunity to test drive a beta version of the TReK 4.3.0 Toolkit software.

- Review Package Contents
  - TReK Requirements included at the end of this package.
  - TReK Software included in TReK 0.6.0 Beta Software Package.

- Review Time Period
  - RID Process: RIDs will be accepted between 3/3/2016 and 3/17/2016.
  - TReK 0.6.0 Beta Software Review: 3/3/2016 – 4/3/2016.

For more information about TReK please visit the TReK Web Site: http://trek.msfc.nasa.gov.

TReK 4.3.0 (TReK Toolkit) Content

Software	Description
CFDP Application	Provides capabilities to perform file transfer functions using the CCSDS File Delivery Protocol (CFDP). This application has a graphical user interface. You can choose to use Native CFDP (CFDP using UDP) or ION CFDP (CFDP over BP). [Updates to support filestore directives using Native CFDP].
CFDP Console Application	Provides capabilities to perform file transfer functions using the CCSDS File Delivery Protocol (CFDP). This application is a console application targeted for use onboard ISS. It was provided to serve two purposes: (1) a CFDP console application for customers to use right out of the box, and (2) an example program showing customers how to use the CFDP Library to perform common CFDP functions. You can choose to use Native CFDP (CFDP using UDP) or ION CFDP (CFDP over BP). [Updates to support filestore directives using Native CFDP]
CFDP Library	Provides an application programming interface to perform file transfer functions using the CCSDS File Delivery Protocol (CFDP). It includes support for CFDP over Bundle Protocol. You can choose to use Native CFDP (CFDP using UDP) or ION CFDP (CFDP over BP). [Updates to support filestore directives using Native CFDP]
Data Library	Provides an application programming interface to create, populate, build, and decompose packets. Includes support for pre-defined and custom headers and packets.
Device Services Library	Provides an application programming interface to perform functions such as creating sockets, sending data, receiving data, etc. Includes support for Bundle Protocol.
EXPRESS Library	Provides support for the following EXPRESS Payload to ISS C&DH System Ethernet interfaces as defined in SSP 52000-IDD-ERP Rev N: Telemetry Generation (including health and status), Command Handling, Ancillary Data, PEP Bundle Request, PEP Procedure Execution Request, and Data Transfer over IP. (New)

Software	Description
GSE Convert Application	The GSE Convert application provides the capability to convert a GSE Packet definition downloaded from the POIC in an ASCII file format to a GSE Packet definition in a TReK metadata file format (a format that can be read by the TReK Packet class in the TReK Data API).
HPEG Application	Provides access to HOSC Payload Ethernet Gateway (HPEG) services. This application has a graphical user interface. It provides the capability to log into the HOSC and request HPEG services. This includes selecting a ground node ID (if applicable), starting and stopping services, and enabling and disabling the HPEG Idle Check. Includes support for DTN. [Updates to support the latest Ku IP Services enhancements.]
HPEG Library	Provides an application programming interface to retrieve HPEG configuration and status information.
IONconfig Application	Provides the capability to generate ION configuration files and scripts. The scripts (Windows batch files and Linux shell scripts) can be used to start and stop ION. This application has a graphical user interface.
IONizer Application	Provides capabilities to start, stop, and monitor ION. This application has a graphical user interface.
IONizer Library	Provides an application programming interface to start, stop, and monitor ION.
TReK Help Application	Provides integrated help for all TReK applications and libraries.

TReK Beta Software Testing Program

- The TReK Beta Software Testing Program:
  - Provides an opportunity for you to test drive the TReK software and provide feedback to improve the product.
    - Feedback is accepted throughout the entire Beta Software Testing time period.
    - You can send input via an e-mail to trek.help@nasa.gov.
    - All input is entered, assigned a number, and tracked to resolution.
    - TReK Development Team will correspond with you on any input received via trek.help@nasa.gov.
  - Provides an opportunity for you to review TReK requirements and design.
    - This includes the opportunity to input RIDs.
    - See RID process on the following chart.
    - RID Review Period is shorter than the TReK beta software testing period due to schedule constraints.
  - Provides early access to the TReK software.

Note: Due to ITAR requirements, a HOSC Portal Account with access to the TReK Software Download area is required to participate in the TReK Beta Software Testing Program.

RID Process

- RIDs will be accepted from all participants
- RIDs can be submitted to trek.help@nasa.gov
- RIDs will be accepted between 3/3/2016 and 3/17/2016.
- RIDable Material
  - TReK Requirements included at the end of this package.
  - TReK Software Design included in TReK 0.6.0 Beta Software Package.
- RIDs will be accepted for:
  - Missing Requirement
  - Design Does Not Meet Requirement
  - Anything else – please send a comment to trek.help@nasa.gov.

Step	Description
1.	All RIDs will be entered, assigned a number, and tracked to resolution.
2.	Within approximately 4 weeks following the RID closure date, all RIDs are brought to a Review Board meeting in a RID disposition package.
3.	TReK Team coordinates closure of RID(s) with NASA Review Board Chair (as applicable).
4.	TReK Team will coordinate RID responses with RID originators.
5.	Signed off RIDs will be posted to the TReK Web Site (http://trek.msfc.nasa.gov).

- Application Programming Interface Capabilities
    - TReK shall provide the capability to retrieve HPEG status information.
    - TReK shall provide the capability to retrieve HPEG destination information.

- Core Requirements
  - TReK shall provide the capability to initiate the following CFDP filestore actions:
    - create file
    - delete file
    - rename file
    - append file
    - replace file
    - create directory
    - remove directory
    - deny file
    - deny directory
  - TReK shall provide the capability to initiate a CFDP message.

Note: These capabilities were previously only available for ION CFDP. They are now available for Native CFDP.